Fissidens (sect. *Aloma*) *cylindrothecus* (Bryopsida: Fissidentaceae), a New Species from Colombia

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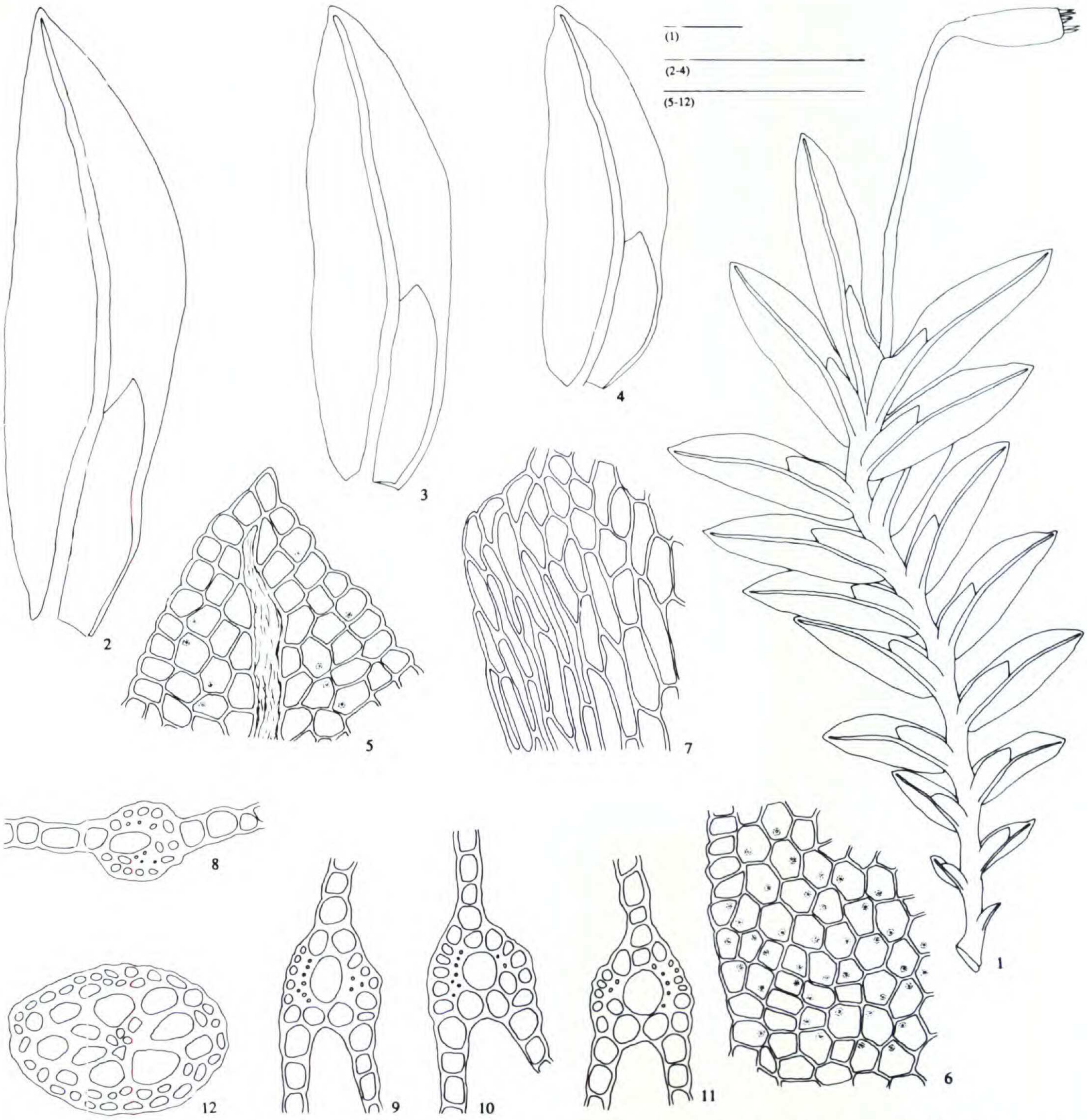
During the course of a review of section *Aloma* C. Müll. for a monograph of the neotropical species of *Fissidens*, a specimen from southwestern Colombia thought initially to represent a variant of *F. laxus* Sullivant & Lesq. (including *F. pellucidus* Hornsch. and *F. flexinervis* Mitten) was found on closer examination to have a number of unusual characteristics. Thus we propose the following new species to accommodate this collection.

Fissidens cylindrothecus Pursell & Aguirre, sp. nov. TYPE: Colombia. Cauca: Munic. de Guapi, Parque Natural Nacional Isla Gorgona, Camino Poblado–Playa Pizarro, 50 m, 3 June 1986, *Santana, Lozano & Rangel 737* (holotype, COL; isotype, PAC). Figures 1–13.

Species haec ab aliis speciebus in sectione cellulis ductibus insolenter magnis (1–2 distalibus et 3–4 proximalibus), thecis cylindricis, dentibusque peristomatis singulariter spiraliter incrassatis, fere usque ad basin divisis, inflexis siccis et erectis humidis differt.

Plants small, in scattered patches, pale to olive-green, often tinged with brown. Stems unbranched or branched near distal ends, erect to decumbent, to ca. 6 mm long and 2 mm wide, with as many as 11 pairs of leaves; axillary hyaline nodules lacking; in cross section with 1–2 tiers of small, thick-walled outer cells, larger, thinner-walled inner cells, and central strand; rhizoids smooth, basal and axillary. Leaves usually imbricate distally, little shrunken when dry, somewhat brittle, lanceolate, to ca. 2 mm long and 0.3–0.5 mm wide where broadest, acute to cuspidate; margins crenulate-serrulate but nearly entire in proximal parts of vaginant laminae; costae ending 2–3 cells below the leaf apices, (27–)31–40(–49) μm broad at distal ends of vaginant laminae, terete in cross section, with 2 stereid bands, (1–)2 guide cells in distal parts, and 3(–4) guide cells in proximal parts, one guide cell often larger than others; dorsal laminae usually rounded at insertion, not decurrent; vaginant laminae ca. ⅖(–½) the leaf length, unequal, the minor laminae usually attached ca. ½ the distance between the costae and leaf margins, infrequently rounded and attached only along costae, sometimes narrowed to costae in perichaetial leaves, homostichous; laminal cells unistratose, guttulate, firm-walled, smooth, bulging, somewhat elongate-hexagonal to irregularly quadrate, 14–29 μm long, marginal cells somewhat smaller, 11–15 μm long, often somewhat wider; inner cells of vaginant laminae similar to upper cells, marginal vaginant laminal cells often narrow and elongate, forming weak and often inconspicuous limbidia. Autoicous; perigonial branches small and bud-like or somewhat elongate and emergent to extending well above the enveloping vaginant laminae; perichaetia terminal on main stems and branches. Sporophytes one per perichaetium; setae yellow, darkening with age, (0.9–)1.4–1.9 mm long; thecae inclined to pendant, ± symmetric, cylindric, 0.5–0.7 mm long, stomatose, exothecial cells mostly oblong, trigonous; annuli lacking; peristomes inflexed when dry, erect when moist, each consisting of 16 teeth, each tooth divided nearly its entire length into 2 slightly unequal prongs, with ± horizontal thickenings proximally and spiral thickenings distally, ventral trabeculae distinctly wider than lamellar thickenings but lacking fimbriate ornamentation; opercula long-rostrate. Spores smooth, 11–13(–18) μm. Calyptrae smooth, cucullate, covering only the rostra.

Fissidens cylindrothecus is a remarkable species in both its peristome and costal structure. It is the only neotropical species in section *Aloma* with a peristome that is erect when moist; all other species in the section have peristomes that are erect when dry but strongly inflexed when wet. The peristome of *F. cylindrothecus* is morphologically close to the scariosus type described by Allen (1980), and Bruggeman-Nannenga & Berendsen (1990), which is typical of section *Aloma*. This type of peristome is divided about ⅔ its length and has horizontal ridges



Figures 1–12. *Fissidens cylindrothecus*, Pursell & Aguirre. —1. Habit. —2–4. Leaves. —5. Leaf apex, with guttulae. —6. Median cells of dorsal laminae, with guttulae. —7. Mid-marginal region of vaginant lamina of perichaetial leaf. —8. Cross section of distal region of leaf. —9–11. Cross sections of proximal regions of leaves. —12. Cross section of stem. All drawn from holotype. Bar scale (1) = 0.5 mm; bar scale (2–4) = 0.5 mm; bar scale (5–12) = 100 μm.

(thickenings) on the proximal dorsal lamellae. The horizontal lamellae are succeeded above the bifurcation by vertical ridges, which are replaced by spiral thickenings in the distal portions of the prongs. In addition, the ventral lamellae of the scariosus type are usually equipped with conspicuous fimbriate ornamentations. Peristome teeth of *F. cylindrothecus*, on the other hand, are divided nearly their entire length, the more or less horizontal thickenings of the proximal dorsal lamellae are succeeded immediately by spiral thickenings (Fig. 13), and the ventral trabeculae lack the fimbriate ornamentation.

Guide cells in the costae of *F. cylindrothecus* are often sufficiently large to be noticeable in surface view. This feature was noted by Robinson (1974) in *F. ornaticostatus* Robinson and has been observed also in some collections of *F. laxus* made recently in French Guiana by W. R. Buck. The costae of species of section *Aloma*, as well as those in most other sections of *Fissidens*, have two stereid bands separated by a row of 2 guide cells distally and 3 guide cells proximally, which are arranged more or less in the form of a triangle. Although this is basically the costal structure seen in *F. cylindrothe-*

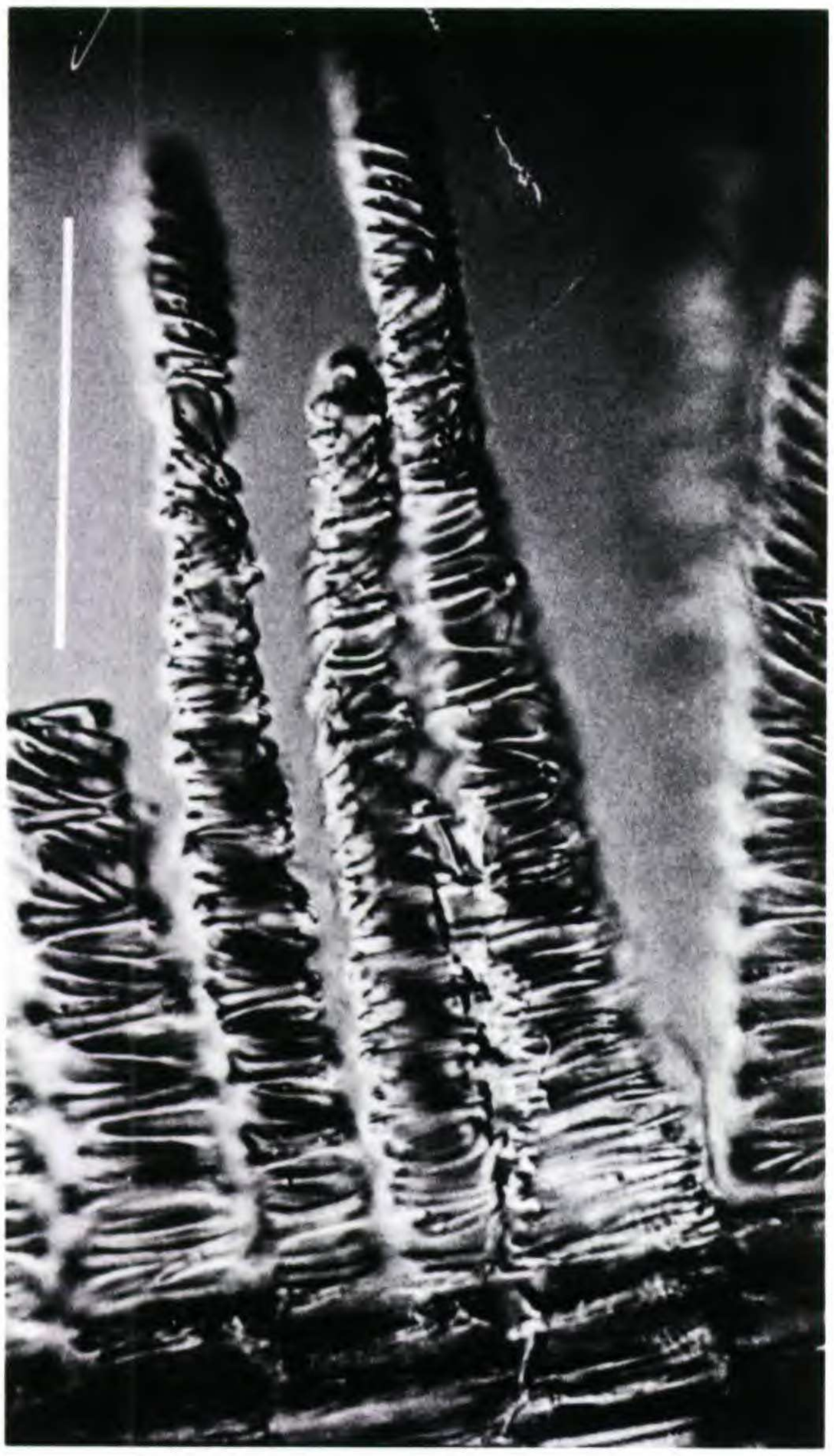


Figure 13. Teeth from peristome of *Fissidens cylindrothecus*. sp. nov. Photographed from isotype. Bar scale = 45 μm.

cus, the costa in this species can have one or two guide cells in its distal length and 3–4 guide cells in its proximal portion (Figs. 8–11). Costae of the French Guianian specimens of *F. laxus*, however, have the typical structure. Since *F. ornaticostatus* is represented by only two stems, sections have not been made to determine the number of guide cells present. Robinson's illustrations, however, show two rows of guide cells in the distal part of the leaf and a single row of very large guide cells proximally; this reflects what can be seen in surface examination of the holotype (*Skottsberg 26 pro parte*, S).

Fissidens cylindrothecus may be confused with *F. diplodus* Mitten and *F. cylindraceus* Mitten because all three species have long cylindrical capsules. Moreover, all three have peristomes that stand erect when moist. Both *F. diplodus* and *F. cylindraceus*, however, belong to section *Semilimbidium* C. Müll. They are characterized by distinct unistratose limbidia on the vaginant laminae of perichaetial leaves, and either by bluntly unipapillose laminal cells (*F. diplodus*) or pluripapillose laminal cells (*F. cylindraceus*). In addition, the peristome teeth of *F. diplodus* are more or less undivided, and vertically striate and papillose; the peristome teeth of *F. cylindraceus* are each divided almost the entire length into two slender prongs that have vertically oriented thickenings proximally and spiral thickenings distally.

Fissidens cylindrothecus is most closely related to *F. laxus*, a widely distributed and variable species in the Neotropics and also the Paleotropics of Asia. The two species are best distinguished by their peristomes (see above) and capsule shape, cylindric and ovate, respectively. Otherwise, both species have relatively large, smooth, firm-walled laminal cells and costae that end below the leaf apices. Guttulae (see Pursell, 1989) are characteristic of many species in section *Aloma* and are a prominent feature of most specimens of *F. laxus*. These structures are not as conspicuous in *F. cylindrothecus*, but this could be a feature of this initial gathering of the species only. As stated earlier, large guide cells are present in a number of specimens from French Guiana that have been assigned to *F. laxus*. These specimens, however, are sterile. Sporophytes could show that these populations belong to *F. cylindrothecus* or perhaps to an undescribed species.

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